5-2018

Yoga and Its Influence on Children's Behavior

Paige Sellen

Yoga and Its Influence on Children's Behavior

An honors thesis/project in partial fulfillment of the requirements for the degree of Honors Baccalaureate in Nursing

By

Paige Sellen

Honors Nursing Student

Spring 2018

University of Arkansas

_____

Dr. Marilou Shreve

Honors Thesis/Project Director

_____

Dr. Allison Scott

Committee Member

_____

Dr. Charleen McNeill

Committee Member

Abstract

This study looked at the impact ten minutes of daily yoga had on the behavior of elementary school children. Yoga was led by classroom teachers once daily for ten minutes over a sixteen-week period. At weeks one, eight, and sixteen, classroom teachers evaluated student behavior in six categories: personal awareness, attention, rapport with friends, rapport with teacher, following rules and transition between activities. The teachers rated the behaviors on a never, sometimes, mostly or always scale. The data was then analyzed and interpreted. Results revealed a significant difference in the attention, ability to follow rules, transition between activities, and personal awareness from the beginning of the yoga implementation to the eight-week evaluation. Results suggest that implementing yoga into daily routines for elementary school students will improve their behavior.

Introduction

Behavioral issues in elementary school children are an increasing problem in the United States. A recent study conducted by the National Research Council and Institute of Medicine noted one in five children deal with a mental disorder every year (National Center for Chronic Disease Prevention and Health Promotion, 2016). These include disorders such as attention deficit hyperactivity disorder (ADHD), Tourette syndrome, and other mental and behavioral disorders. Behavioral disorders are commonly treated with a simple prescription for medication. In fact, from 1990-1995 a 2.5-fold increase in the use of methylphenidate was observed in children with ADHD in the United States (Renoux, Shin, Dell'Aniello, Fergusson, & Suissa, 2016). Similarly, from 1995-2010, a fourfold increase in ADHD medication visits was noted, with stimulant medication use in children with ADHD seeing an almost 2.5% increase from 1996-2012 (Renoux et al., 2016). The disruptive behavior seen in classrooms is not only outbursts of anger, but also difficulty focusing on classwork. With prescription use to combat behavioral disorders on the rise, it may be time to look at alternative and/or supplemental options to combat behavioral issues. Many elementary schools utilize recess to act as a break in the day for children to let out pent-up energy. A more structured intervention may serve to better and more consistently aid in regaining elementary school children's composure.

Literature Review

Mind-body therapies, such as yoga, are in the top ten used complementary therapies in both adults and children (Section on Integrative Medicine, 2016). There are multiple effects of yoga; from reducing stress, to lowering blood pressure and heart rate, the mind-body exercise is one with several benefits and few adverse effects (Eggleston, 2015). A 12-week program evaluating the effects of yoga noted overall improvement in health promotion and health

maintenance in children (Telles, Singh, Bhardwaj, Kumar, & Balkrishna, 2013). Improvements in spatial memory, concentration and strategic planning were noted, as well as an improved sense of well-being. These findings suggest that yoga has effects not only physically, but also mentally and emotionally (Telles et al., 2013).

Research indicates incorporating yoga into education curriculum can improve performance at school, including classroom behavior, self-esteem, and emotional health (Section on Integrative Medicine, 2016). Behavior is defined as "the response of an individual, group, or species to its environment" (Merriam-webster.com, 2017). The classroom environment may play a role specifically in the behavior of children at school. Griggs, Mikami, & Rimm-Kaufman (2016) suggests that both classroom organization and emotional support offered in the classroom may influence the behavior of children within. The more organization the classroom offers and the more warmth and support teachers provide to students may lead to a reduction in externalizing and internalizing student behaviors (Griggs, Mikami, & Rimm-Kaufman, 2016).

Ali & Gracey (2013) define disruptive behavior as repeated behavior that interrupts the normal education process with the intention of interruption. When asked, students claimed that disruptive behaviors inhibit learning and faculty said that misbehavior interrupts the class and inhibits learning (Ali & Gracey, 2013). With the implementation of yoga, disruptive behaviors may be able to be curbed, leading to improved learning for both previously disruptive students and other students in the classroom setting.

Accardo (2017) refers to a study done specifically in students in India with ADHD who participated in one-hour yoga sessions twice a week. A similar study was done in which students diagnosed with Autism Spectrum Disorder (ASD) participated in eight 45-minute yoga sessions (Accardo, 2017). Positive effects of yoga were found in both of these studies. In the study with

students diagnosed with ADHD, 91% saw some sort of improvement in either academic or social performance when reported by teachers and/or parents (Accardo, 2017). In that same study, 39% of students no longer met the qualifications of ADHD (Accardo, 2017). In the study with students diagnosed with ASD, similar positive results were seen such as a decrease in atypical behavior and depression (Accardo, 2017).

Butzer et al. (2014) compared improvements in stress and behavior between second and third-grade classrooms after a 10-week yoga intervention. The second-grade classroom displayed improvements in social interactions, attention spans and concentration, ability to stay on task, academic performance, ability to deal with stress and anxiety, confidence and self-esteem, and overall mood, thus making the classroom more functional and a better learning environment for the teachers and students alike. The third-grade teacher did not note these improvements in her class, however, both teachers noted improvements in creativity, ability to control behavior, and ability to manage anger (Butzer et al., 2014).

In a study done by Eggleston (2015), 20 middle school children opted to participate in 30-minute yoga sessions once a week for 36 weeks. Measures included self-esteem, biometric data, and perceived stress (Eggleston, 2015). At the end of the study, students reported feeling more calm, relaxed, and less stressed (Eggleston, 2015). Difficulty focusing in class and low self-esteem were common findings before the study began; after the study, findings revealed a lower perceived stress level as well as higher scores in reported self-esteem (Eggleston, 2015). Some students suggested that this study impacted them so greatly that they would like to see it done every day at school (Eggleston, 2015).

Telles et al. (2013) measured the effects of yoga on behavior using a ten-point Likert scale. After the implementation of 45 minutes of yoga per day five days a week, there was an

improvement in academic performance, obedience, attention, punctuality, behavior with friends, and behavior with teachers. Surveys, questionnaires and activities are tools that can be utilized to measure the outcomes of these studies.

Aim

The aim of this study is to determine the impact yoga has on the behavior of elementary school students.

Research Question 1: How does the implementation of ten minutes of yoga per day in the elementary school classroom influence the students' behavior?

Research Design and Methods

Data collection began following approval by the University of Arkansas Institutional Review Board (IRB) and approval by the school. Kindergarten through 5th grade classes in Eureka Springs Elementary School participated in the study. Students included in the study were able to speak and read English and had no psychological limitations. A sample size of 80 students was collected. Each parent signed a consent form for his or her student to participate in the study. At the time of the assessment, verification that the student wished to participate in the study was documented via an assent form. If the child was too young to sign an assent form, verbal consent with a witness was documented. Students were able to withdraw from the study at any time had the student not wanted to participate any longer.

To implement yoga into the classroom setting, teachers were taught yoga, that they then taught to their students. Yoga positions included mountain, tree, warrior I, warrior II, downward dog, table top, half boat, child's pose, lying twist, and chill pose. These positions were chosen to minimize the risk of falling or over stretching. The teachers incorporated ten minutes of yoga per day into their classroom schedules, wherever they saw the yoga best fit. Typically, teachers

implemented yoga into a time when they saw their classroom tended to lose focus.

Prior to the yoga starting, teachers were sent six analog scales, with variables including personal awareness, attention, rapport with friends, rapport with teacher, following rules and transition between activities. The teachers evaluated each student based on a one to four scale, four being the highest score, and one being the lowest. This data served as the initial data in the research study, pre-yoga implementation. At the eight-week mark, the teachers were sent the same six analog scales to fill out according to how students' behavior had changed, if at all, over the past eight weeks of yoga intervention. Similarly, at the sixteen-week mark and the conclusion of the yoga implementation, the teachers evaluated the students' behavioral changes using the same six analog scales.

The analog scales were then measured using a Likert scale to determine where each student fell at each interval for each variable. The data was then compiled to determine if yoga has any effect on the behavior of elementary school children. These analog scales had been used in a previous research study; although the reliability and validity of the tool had not been well established, this study added to the testing of the effectiveness of the scale. The data was then analyzed, and results were determined.

Results

A sample size of 82 students was included in the study. The students' behavior was evaluated at the beginning of the study, eight weeks into the study, and at sixteen weeks, which was the end of the study. The variables were assessed on a never to always scale which were translated to a one to four scale for data analysis purposes. The variables, rapport with teachers and rapport with friends, were combined into a rapport subscale and the other four variables of personal awareness, attention, following rules, and transitions between activities were combined

into a behavior subscale. The initial, eight-week, and final data collections served as the three time points.

A multivariate analysis of variance (MANOVA) test was run to look for differences in the time points. The overall test of time was significant, indicating that some measures functioned differently over time from each other, $F(4, 52) = 5.85$, $p = .0006$.

MANOVA Test Criteria and Exact F Statistics for the Hypothesis of no measure*time Effect
H = Type III SSCP Matrix for measure*time
E = Error SSCP Matrix

S=1 M=1 N=25

Statistic	Value	F Value	Num DF	Den DF	Pr > F
Wilks' Lambda	0.68966174	5.85	4	52	0.0006
Pillai's Trace	0.31033826	5.85	4	52	0.0006
Hotelling-Lawley Trace	0.44998619	5.85	4	52	0.0006
Roy's Greatest Root	0.44998619	5.85	4	52	0.0006

Table 1 MANOVA Test for Measure of Time Point Differences

Follow up tests were then done with an alpha of 0.0125 to evaluate the differences further. An alpha of 0.0125 was used in order to prevent false significance when data was analyzed. A larger alpha would have produced results signifying significant results that were not truly significant.

Contrast Variable: measure_1*time_1

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Mean	1	1.14285714	1.14285714	2.07	0.1558
Error	55	30.35714286	0.55194805		

Contrast Variable: measure_1*time_2

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Mean	1	0.36160714	0.36160714	0.80	0.3753
Error	55	24.88839286	0.45251623		

Contrast Variable: measure_2*time_1

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Mean	1	7.87500000	7.87500000	20.75	<.0001
Error	55	20.87500000	0.37954545		

Contrast Variable: measure_2*time_2

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Mean	1	0.75446429	0.75446429	2.48	0.1212
Error	55	16.74553571	0.30446429		

Table 2 Contrast Variable Test for Specific Measure of Time Point Differences

The rapport subgroup did not show any significant variation over any of the time points. The first measure did not differ from the third, $F(1, 55) = 2.07$, $p = .1558$, nor did the 2nd time point differ from the 3rd, $F(1, 55) = .8$, $p = .3753$. However, there were time differences for the behavioral subgroup. The difference between time point one and time point three was significant, $F(1, 55) = 20.75$, $p < .0001$ but the difference between time point two and time point three was

not significant, F(1, 55) = 2.48, p = .1212. This variation in significance reveals a quadratic leveling off effect.

Level of measure	Level of time	N	Mean	Std Dev
1	1	56	3.16964286	0.62723626
1	2	56	3.39285714	0.58554004
1	3	56	3.31250000	0.64358725
2	1	56	2.82142857	0.64440650
2	2	56	3.08035714	0.57624794
2	3	56	3.19642857	0.62288604

Table 3 Means and Standard Deviations of Time Measurements

Discussion

There were 82 students that took part in this study. Of the 82 students and the variables measured, there was significant evidence to support that the implementation of ten minutes of yoga per day does have a positive impact on the students' behavior. When data was combined into two subgroups, the difference in time points in the behavioral subgroup was significant. Variables included in the behavioral subgroup when data was analyzed include attention, personal awareness, transition between activities, and following rules.

It is worthy of mentioning that there was significance between the first time point and the third time point in the behavioral subgroup. When broken down, the difference from time point one to time point two was significant, however, the difference from time point two to time point three was not significant. This signifies that impact of the yoga may have had a maximum limit so to speak, displaying a leveling off of the impact. To further interpret this data, it is important to look at several factors that may have caused this leveling off effect.

The first point to mention is the subjectivity of the data. Each teacher evaluates each

student slightly different, and there is no way to truly quantify the behavior of the students and make it equal across all scopes. For this reason, several things may contribute to the teachers' evaluation of the students, including the child's behavior that specific day which may or may not be characteristic of his or her general behavior, the stress level of the teacher, the time of day at which the evaluation is done, etc. All of these factors must be considered when looking at the data overall and may be the cause for variation in results.

Secondly, if at the eight-week evaluation, students' behavior has dramatically improved since the initial evaluation, teachers may give a two or three-point increase. For example, a student at initial evaluation may have never been able to follow directions, resulting in a one for that category. At the eight-week mark if that student is almost always following directions, that would result in a three. Thus, by the final evaluation, to say that a student is *always* following directions would indicate no error on the student's behalf. Thus, the teacher may again rate that student at a three to leave room for occasional error. In this example, the increase from time point one to two is significant, however, the increase from time point two to three is not. This may contribute to the "leveling off" effect seen in this study. Ultimately, the teachers participating in the study chose a smaller Likert scale for convenience, however a bigger Likert scale may have allowed more improvement in the students.

Lastly, it is important to consider factors outside of the study that impact students' behavior in the classroom, such as family or friend stressors, academic stressors, and any other variables that may negatively impact a child's behavior.

Overall, the positive impact that yoga had on the behavior of elementary school children revealed that it was beneficial to implement yoga in the classroom. With further research, it would be important to obtain a larger sample size over a larger region to determine if the

significance in the behavioral impact yoga had continues. Similarly, it would be valuable to look at how big of an impact the yoga has specifically on the academic performance of students. This research along with future research alludes to the implementation of yoga in the classroom nationwide. Yoga, having few negative effects and several positive ones such as improving the behavior of elementary school children seems that it can only do good in the classroom setting. A teacher participating in the study stated that she implemented the yoga into her schedule when she saw that her class seemed to lose focus. She mentioned that after the yoga, she was able to regain control of her classroom more so than she could before. Similar experiences leave strong evidence that yoga is a beneficial mind-body mechanism in the classroom setting.

Limitations

In this study, the population was a convenience sample based on teachers' willingness to participate in the study. Similarly, each participant had to be willing to take part in the study. The research was only conducted in one region of the country and was only done in a small rural school district. However, this left ample room for future expansion of the study.

The sample size of 82 students in the study serves as a limitation as well. If the study were done on a larger sample size, it would have the potential to show greater statistically significant results. As the population increases, so does the chance of yoga to positively impact behavior.

Questions were grouped into two different measures: rapport and behavior. Two variables were included in the rapport measure and four in the behavior measure. The small amount of questions in each measure served as limitation to the study as well, limiting the chance of significant differences in time points.

Teacher participation varied which serves as a limitation in this study. Teachers reported

not having the capability to always do the yoga, and when this was the case it may have altered data.

The lack of a control group served as a limitation in this study and is something that should be researched in the future. To be able to compare results in those who have had the yoga intervention and those who have not would be valuable. While improvements may not be seen in the students from the beginning to the end of the study, data with a control group has the potential to show improvements in behavior of the intervention group compared to the control group.

As mentioned previously, the Likert scale used to assess the students' behavior was on a four-point scale per teacher request. The original Likert scale was to be a ten-point scale that may have allowed more room for student improvement throughout the study.

Academic performance was originally a variable to be tested, however due to teacher request, this variable was interchanged for personal awareness. Thus, the impact of yoga on academic performance would be a valuable variable to test in the future.

The subjectivity of the data may also serve as a limitation in this study. With different teachers comes different opinions of good and bad behavior, thus, different results are obtained. This is a barrier that typically comes with most qualitative data, but nonetheless can cause some discrepancies.

Conclusion

This study investigated how ten minutes of yoga per day affects the behavior of elementary school children in the classroom. This research is a vital step in the research of children's behavioral issues relating to academic performance. In an effort to increase attention spans and obedience, and decrease outbursts and misbehavior, the impact of yoga could change

the day-to-day function of elementary school classrooms. Using analog scales recorded by teachers three times throughout the 16-week yoga program, the impact of such a program was evaluated. Overall, it was determined that the implementation of yoga did have a significant impact on the behavior of elementary school children, specifically on their attention, ability to follow rules, transition between activities, and personal awareness. It is important to note that the positive effect of the yoga on students' behavior was noticed more from the initial week of the yoga intervention to the eight-week evaluation. The eight-week evaluation to the final evaluation showed no significant improvement in the behavior of the students. With future research using this study as a basis, stronger evidence may be revealed that supports the implementation of yoga into the classroom schedule across the nation.

References

Accardo, A. L. (2017). Yoga as a school-wide positive behavior support. *Childhood Education, 93*(2), 109-113. doi:10.1080/00094056.2017.1300488

Ali, A., & Gracey, D. (2013). Dealing with student disruptive behavior in the classroom--a case example of the coordination between faculty and assistant dean for academics. *Issues in Informing Science & Information Technology,* 10, 1-015.

Behavior. (2017). Retrieved from https://www.merriam-webster.com/dictionary/behavior

Butzer, B., Day, D., Potts, A., Ryan, C., Coulombe, S., Davies, B., . . . Khalsa, S. B. (2014). Effects of a classroom-based yoga intervention on cortisol and behavior in second- and third-grade students: A pilot study. *Journal of Evidence-Based Complementary & Alternative Medicine,* 20(1), 41-49. doi:10.1177/2156587214557695

Eggleston, B. (2015). The benefits of yoga for children in schools. *The International Journal of Health, Wellness, and Society, 5*(3), 1-7. doi:10.18848/2156-8960/CGP/v05i03/41125

Griggs, M. S., Mikami, A. Y., & Rimm-Kaufman, S. E. (2016). Classroom quality and student behavior trajectories in elementary school. *Psychology in the Schools, 53*(7), 690-704. doi:10.1002/pits.21941

National Center for Chronic Disease Prevention and Health Promotion. (2016). Children's mental health report. Retrieved from https://www.cdc.gov/features/childrensmentalhealth/

Renoux, C., Shin, J., Dell'Aniello, S., Fergusson, E., & Suissa, S. (2016). Prescribing trends of attention-deficit hyperactivity disorder (ADHD) medications in UK primary care, 1995-2015. *British Journal of Clinical Pharmacology, 82*(3), 858-868. doi:10.1111/bcp.13000

Ross, A., & Thomas, S. (2010). The health benefits of yoga and exercise: A review of comparison studies. *Journal of Alternative & Complementary Medicine*, 16(1), 3-12.

doi:10.1089/acm.2009.0044

Section on Integrative Medicine. (2016). Mind-body therapies in children and youth. Pediatrics, 138(3), e20161896-e20161896. doi:10.1542/peds.2016-1896

Telles, S., Singh, N., Bhardwaj, A. K., Kumar, A., & Balkrishna, A. (2013). Effect of yoga or physical exercise on physical, cognitive and emotional measures in children: A randomized controlled trial. *Child and Adolescent Psychiatry and Mental Health*, 7(1), 37-37. doi:10.1186/1753-2000-7-37